CLAIMS

WHAT IS CLAIMED IS:

1. A composition comprising a surface and a modified protein, and optionally a gene transfer vector, wherein the gene transfer vector is bound to the modified protein and the modified protein is covalently bound to the surface.

2. The composition of claim 1, wherein the gene transfer vector is adapted to bind to a receptor on the mammalian cell and wherein the modified protein comprises at least one of a fusion protein and a polypeptide.

3. The composition of claim 1, wherein the modified protein is covalently bound to the surface through a thiol residue and a linker.

4. The composition of claim 1, wherein the gene transfer vector is a viral vector.

5. The composition of claim 4, wherein the viral vector is an adenovirus vector.

6. The composition of claim 5, wherein the adenovirus vector is a member selected from the group consisting of a first-generation adenovirus vector, a second-generation adenovirus vector, an adenovirus vector of large DNA capacity and a deleted adenovirus vector.

7. The composition of claim 1, wherein the surface is a metal surface.

8. The composition of claim 7, wherein the metal surface is a surface of a medical device.

9. The composition of claim 8, wherein the medical device is selected from the group consisting of a stent, a heart valve, a wire suture, a joint replacement, a urinary dilator, an orthopedic dilator, a catheter and a endotracheal tube.

10. The composition of claim 8, wherein the medical device is at least one of an internal device and an external device.

11. The composition of claim 8, wherein the medical device is coated with a layer of the linker, a layer of the modified protein and a layer of the gene transfer vector.

12. The composition of claim 2, wherein the fusion protein is generated through intein-mediated protein ligation.

13. The composition of claim 2, wherein the fusion protein comprises at least a fragment of a CAR protein and a receptor targeting ligand.

14. The composition of claim 13, wherein the fragment of the CAR protein is an extracellular domain of CAR or an immunoglobulin D1 domain of CAR.

15. The composition of claim 13, wherein the receptor targeting ligand is selected from the group consisting of apolipoprotein E, transferrin, a vascular endothelial growth factor, a

transforming growth factor-beta, a fibroblast growth factor, an RGD containing peptide and folic acid.

16. The composition of claim 2, wherein the receptor is selected from the group consisting of a lipoprotein receptor, a transferrin receptor, a VEGF receptor, a TGF-beta receptor, an FGF receptor, a recombinant integrin receptor protein, a folic acid receptor and a folate receptor.

17. A method for preparing the composition of claim 1, the method comprising:

(a) providing a protein;

(b) modifying the protein with a reagent to contain a reactive group, thereby yielding a modified protein;

(c) providing a surface;

(d) treating the surface with a surface modifier comprising a linker and a functional group;

(e) reacting the modified protein with the functional group on the surface in order to covalently bind the modified protein to the surface via the linker; and optionally

(f) binding the gene transfer vector to the modified protein.

18. The method of claim 17, wherein the protein is a CAR protein or fragment of CAR.

19. The method of claim 18, wherein the fragment of CAR is an immunoglobulin D1 domain of CAR.

20. The method of claim 17, wherein the protein is a fusion protein.

21. The method of claim 20, wherein the fusion protein comprises a fragment of CAR ligated to a receptor targeting ligand by intein-mediated protein ligation.

22. The method of claim 21, wherein the fragment of CAR is an extracellular domain of CAR or an immunoglobulin D1 domain of CAR.

23. The method of claim 21, wherein the receptor targeting ligand is selected from the group consisting of apolipoprotein E, transferrin, a vascular endothelial growth factor, a transforming growth factor-beta, a fibroblast growth factor, an RGD containing peptide and folic acid.

24. The method of claim 17, wherein the reagent is a cysteine and the reactive group is a thiol group or an avidin-biotin affinity construct.

25. The method of claim 17, wherein the surface is a surface of a medical device.

26. The method of claim 25, wherein the medical device is selected from the group consisting of a stent, a heart valve, a wire suture, a joint replacement, a urinary dilator, an orthopedic dilator, a catheter and a endotracheal tube.

27. The method of claim 25, wherein the medical device is at least one of an internal device

and an external device.

28. The method of claim 17, wherein the surface modifier is polyallylamine bisphosphonate, the linker is an entity containing a reactive succinimide and a pyridyl-dithiol group, and the functional group is selected from the group consisting of an amino group, a sulfhydryl group, biotin reactive succinimides, epoxy-residues and aldehyde functionalities.

29. The method of claim 17, wherein the gene transfer vector is a viral vector.

30. The method of claim 29, wherein the viral vector is an adenovirus vector.

31. The method of claim 30, wherein the adenovirus vector is a member selected from the group consisting of first-generation adenovirus vector, second-generation adenovirus vector, adenovirus vector of large DNA capacity and deleted adenovirus vector.

32. A method of delivering a viral vector to an animal tissue, the method comprising administering to a body location in fluid communication with the animal tissue the composition of claim 1.